What is claimed is:

1. A process for producing coatings of iridium oxide, comprising the following steps:

a) applying colloidal IrO_x where x is from 1 to 2 to a surface,

b) drying the coated surface and

c) firing the surface at a temperature of from 300 to 1000°C,

steps a to c being repeatable until the desired layer thickness has been obtained.

2. The process as claimed in claim 1, **characterized in that** the colloidal IrO_x where x is from 1 to 2 is obtained by admixing an aqueous, alcoholic and/or aqueous alcoholic solution of an Ir salt, optionally with stirring, with a Brønsted base.

3. The process as claimed in claim 1, **characterized in that** the Brønsted base used comprises alkali metal hydroxides, especially NaOH or KOH.

4. The process as claimed in claim 3, **characterized in that** the aqueous solution of the Ir salt is adjusted to a pH of > 12, preferably ≥ 13.

5. The process as claimed in one of claims 2 to 4, **characterized in that** the Ir salt is selected from the halides, nitrates, sulfates, acetates, acetylacetonates, the hydrates of the above and the mixed salts with other metal salts, especially the alkali metal-iridium salts, particular preference being given to $IrCl_3 \cdot H_2O$, $IrCl_4 \cdot H_2O$, $H_2IrCl_6 \cdot H_2O$, $Na_2IrCl_6 \cdot H_2O$, $K_2IrCl_6 \cdot H_2O$.

6. The process as claimed in one of claims 1 to 5, **characterized in that** the surfaces to be coated are selected from metal and metal oxide surfaces, in

particular from Ti, TiO_2, ZnO, SnO_2 and glass.

7. The process as claimed in claim 6, **characterized in that** the surface to be coated is the surface of a Ti electrode, in particular an electrode for the evolution of oxygen and evolution of chlorine or an electrode for the oxidation of organic residues in drinking water.

8. Colloidal iridium oxide which has a particle size of $\leq$ 10 nm, in particular $\leq$ 3 nm.

9. A process for preparing colloidal iridium oxide, in which an aqueous, alcoholic or aqueous-alcoholic solution of an Ir salt, optionally with stirring, is adjusted to a pH of > 12, preferably $\geq$ 13, and the resulting mixture is subsequently stirred at a temperature of from 0 to 100°C over a period of from 3 to 72 hours.